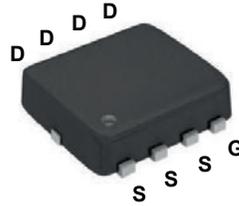
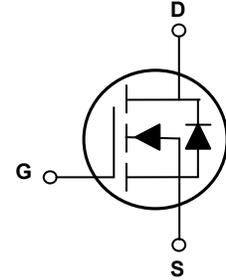


Main Product Characteristics

$V_{(BR)DSS}$	30V
$R_{DS(ON)}$	3.6mΩ (max.)
I_D	70A



PPAK3x3



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The GSGN3R603 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

Absolute Maximum Ratings ($T_A=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Parameter.	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, @ Steady-State ($T_C=25^{\circ}C$)	I_D	70	A
Continuous Drain Current, @ Steady-State ($T_C=100^{\circ}C$)		45	A
Pulsed Drain Current ($T_C=25^{\circ}C$) ¹	I_{DM}	320	A
Power Dissipation ($T_C=25^{\circ}C$) ²	P_D	34	W
Single Pulse Avalanche Energy	E_{AS}	36	mJ
Single Pulse Current	I_{AS}	12	A
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	50	$^{\circ}C/W$
Junction-to-Case	$R_{\theta JC}$	3.68	$^{\circ}C/W$
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to + 150	$^{\circ}C$
Soldering Temperature (SMD)	T_{sold}	260	$^{\circ}C$

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	30	-	-	V
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V, T _J =25°C	-	-	1.0	μA
		V _{DS} =30V, V _{GS} =0V, T _J =125°C	-	2.0	-	
Gate-to-Source Forward Leakage	I _{GSS}	V _{DS} =0V, V _{GS} =20V	-	-	100	nA
		V _{DS} =0V, V _{GS} =-20V	-	-	-100	
Static Drain-to-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	3.4	3.6	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.1	-	2.5	V
Dynamic and Switching Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1MHz	-	1071	-	pF
Output Capacitance	C _{oss}		-	648	-	
Reverse Transfer Capacitance	C _{riss}		-	54	-	
Total Gate Charge ^{3,4}	Q _g	I _D =20A, V _{DD} =15V, V _{GS} =4.5V	-	9.5	-	nC
Gate-to-Source Charge ^{3,4}	Q _{gs}		-	4.4	-	
Gate-to-Drain ("Miller") Charge ^{3,4}	Q _{gd}		-	2.9	-	
Gate-to-Plateau ^{3,4}	V _{plateau}		-	3.4	-	V
Turn-On Delay Time ^{3,4}	t _{d(on)}	V _{DD} =20V, V _{GS} =4.5V, R _G =5Ω, I _D =20A	-	9.7	-	nS
Rise Time ^{3,4}	t _r		-	40	-	
Turn-Off Delay Time ^{3,4}	t _{d(off)}		-	16	-	
Fall Time ^{3,4}	t _f		-	15	-	
Gate Resistance	R _g	f=1MHz	-	1.1	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I _S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	80	A
Diode Pulse Current	I _{S, pulse}		-	-	320	A
Diode Forward Voltage	V _{SD}	I _S =15A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time ³	T _{rr}	I _S =20A, V _{GS} =0V, V _R =30V, dI _F /dt=100A/us	-	26	-	nS
Reverse Recovery Charge ³	Q _{rr}		-	15	-	nC

Notes:

1. Pulse time of 5μs.
2. The dissipated power value will change with the temperature. When it is greater than 25°C, the dissipated power value will decrease by 0.55°C/W for every 1 degree of temperature increase.
3. Pulse test : pulse width ≤ 300μs, duty cycle ≤ 2%.
4. Basically unaffected by operating temperature.

Typical Electrical and Thermal Characteristic Curves

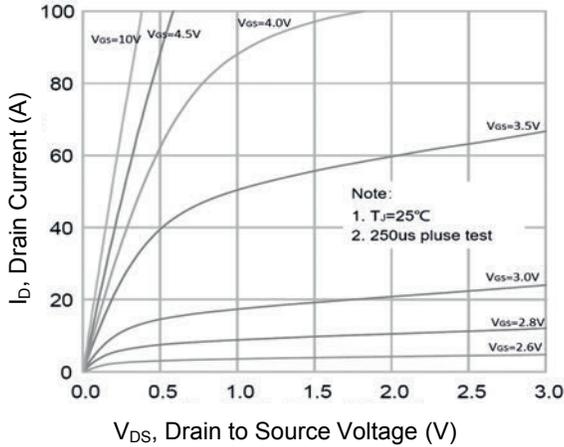


Figure 1. Typical Output Characteristics

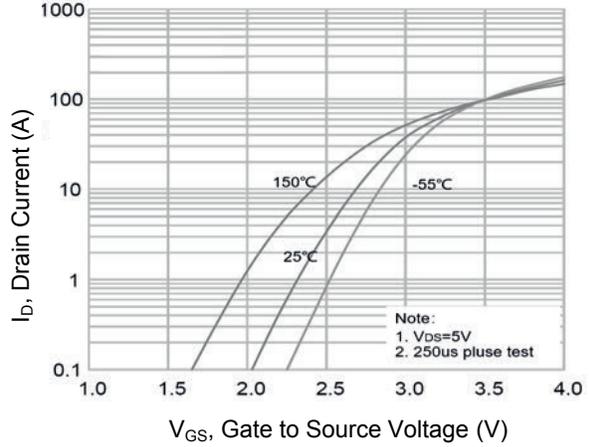


Figure 2. Transfer Characteristics

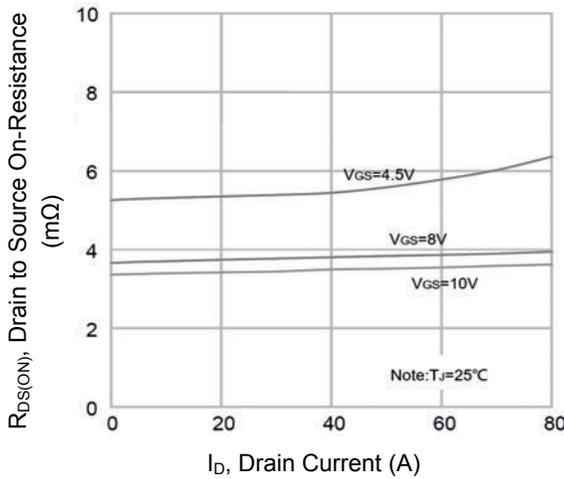


Figure 3. $R_{DS(ON)}$ Vs. Drain Current

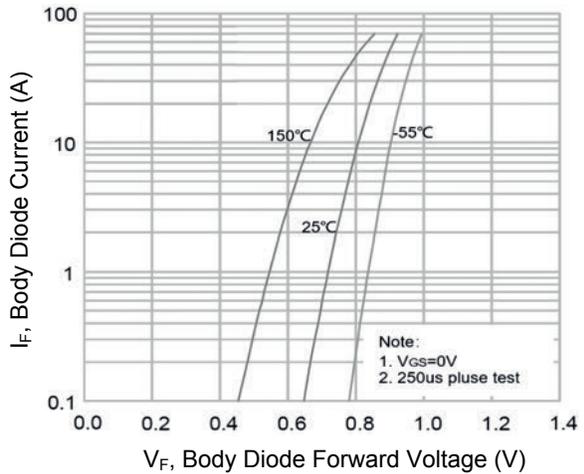


Figure 4. Body Diode Characteristics

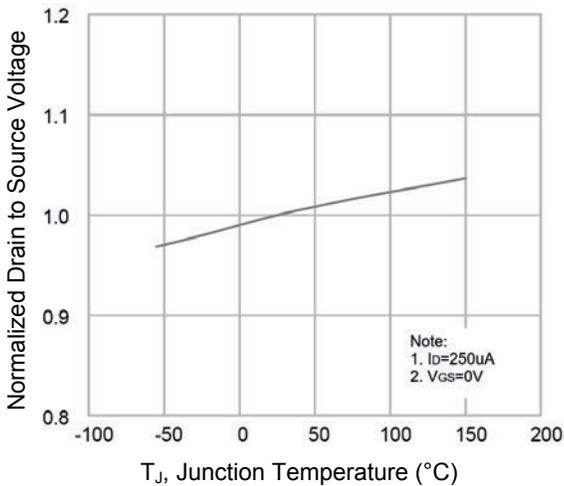


Figure 5. Normalized BV_{DSS} Vs. T_J

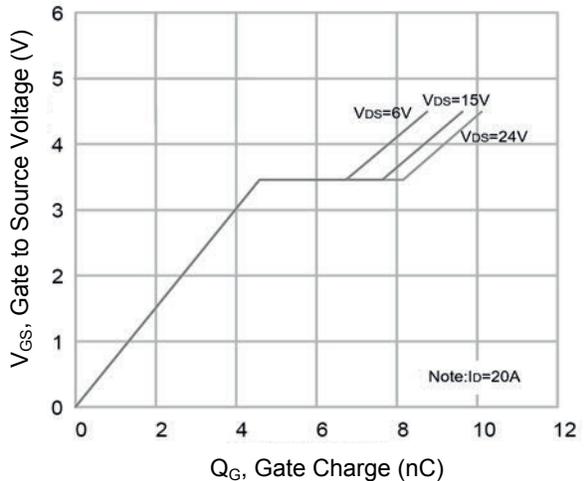


Figure 6. Gate Charge

Typical Electrical and Thermal Characteristic Curves

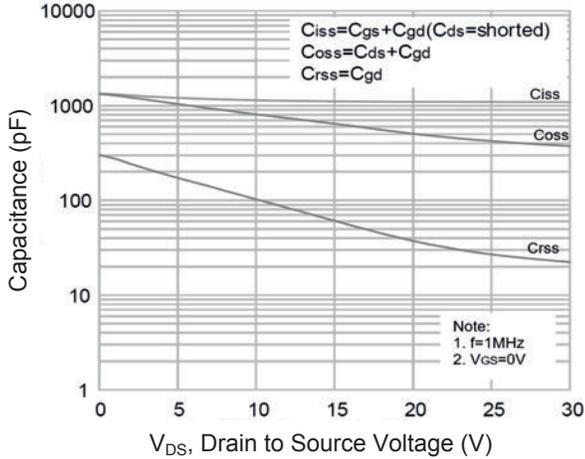


Figure 7. Capacitance Characteristics

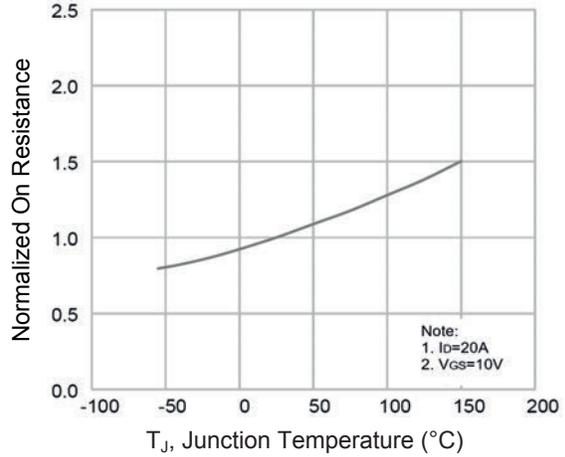


Figure 8. Normalized $R_{DS(ON)}$ Vs. T_J

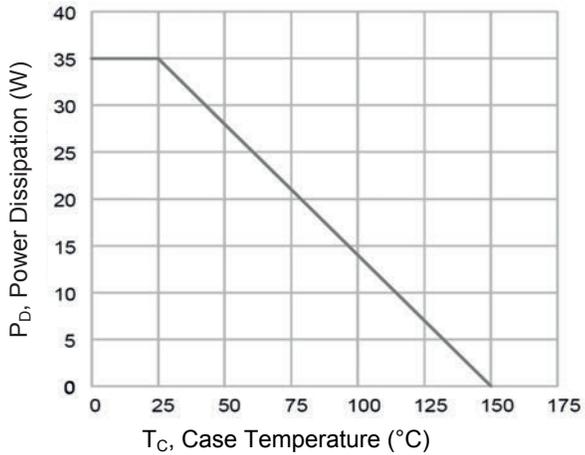


Figure 9. Power Dissipation Vs. T_C

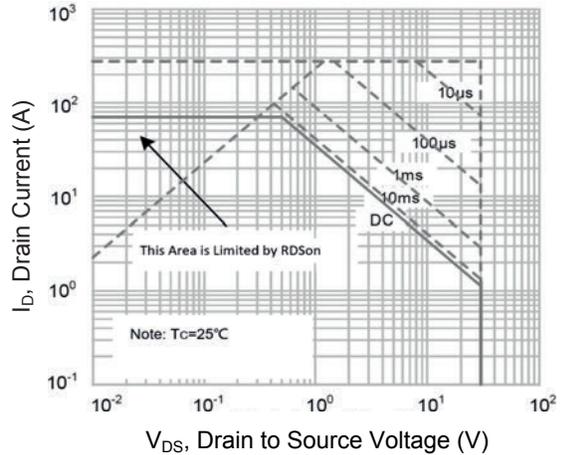
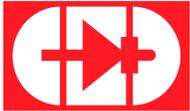
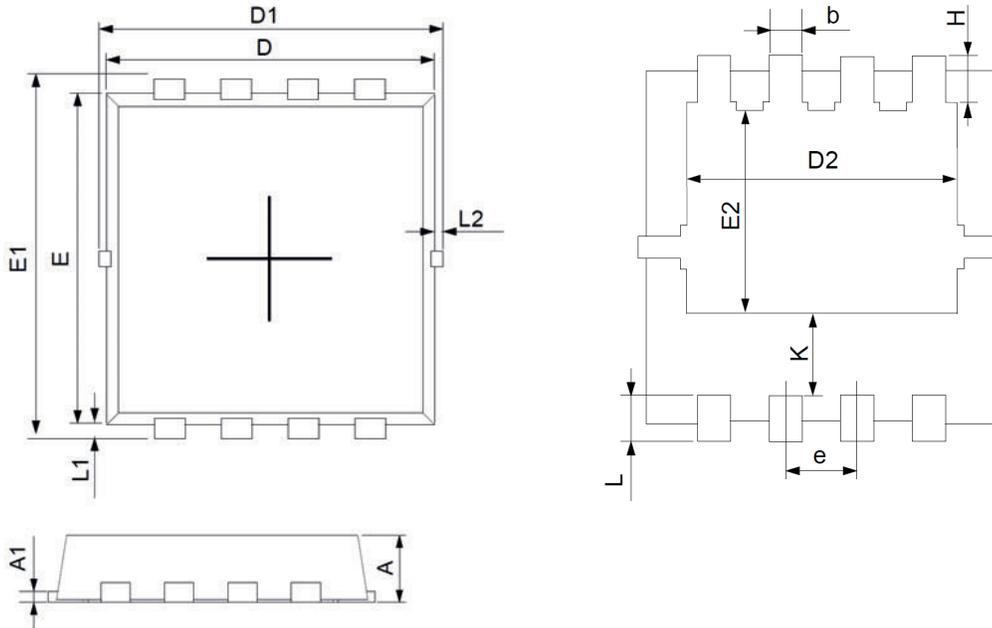


Figure 10. Safe Operation Area



Package Outline Dimensions (PPAK3x3)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.70	0.90	0.028	0.035
A1	0.14	0.20	0.006	0.008
D	3.05	3.25	0.120	0.128
E	2.90	3.10	0.114	0.122
D1	3.10	3.50	0.122	0.138
D2	2.35	2.50	0.093	0.098
E1	3.10	3.50	0.122	0.138
E2	1.64	1.84	0.065	0.072
b	0.25	0.35	0.010	0.014
k	0.59	0.79	0.023	0.031
e	0.55	0.75	0.022	0.030
E4	3.34	3.92	0.131	0.154
L	0.25	0.55	0.010	0.022
L1	0.10	0.20	0.004	0.008
H	0.32	0.52	0.013	0.020